

REMARKS

Claims 1-23 are pending. Applicants have canceled claims 19 and 23 without prejudice. Applicants address each of the objections and rejections in the order in which they appear in the Action.

I. Claim Objections Addressed

Claims 2 and 3 have been objected to as being substantial duplicates of one another. Applicants respectfully submit that Claims 2 and 3 are not duplicates of one another. Claim 2 recites a system wherein the sensor is adapted to produce a sensor signal representative of a predetermined chemical property of the at least one product, while claim 3 recites a system wherein the sensor is adapted to produce a sensor signal representative of a predetermined biological property of the at least one product. It is clear that not all signals representative of a chemical property are also representative of a biological property, and vice-versa. For instance, a chemical sensor may sense the yield of a reaction product (see Example 1, pages 13-14 of the present application), which in some, if not most or perhaps even all, instances will be unrelated to any biological property of that product.

For at least the foregoing reasons, Applicants respectfully request that this rejection be withdrawn.

II. Section 112 Rejection Overcome

Claims 1, 4, 11, 19, and 23 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants respectfully traverse this rejection.

The Action rejects claims 1 and 4 as being indefinite for reciting means adapted to vary the condition, or in the case of claim 4 the physical condition, in, or of, the channel structure. The Action states that one of skill in the art would not be able to determine what the means is and this renders the claims indefinite. Applicants respectfully disagree.

The condition to be varied could be any of various conditions described in the specification including physical condition and chemical conditions, and the specification provides ample description as to the various physical conditions and chemical conditions

to be varied as to make the means adapted to vary these conditions readily apparent to those skilled in the art.

For example, as described in the specification at page 5, lines 1-3, the means may be adapted to vary a physical condition in the channel structure, e.g., temperature, pressure, flow rate, electric field, etc. One of skill in the art would readily appreciate the various means that could be adapted to vary physical conditions such as temperature, pressure, flow rate, electric field, etc. in the channel structure. For example, one of skill in the art would readily appreciate that means adapted to vary the temperature in the channel structure could be any of various temperature controllers (e.g. a heating element) as is well known in the art. As another example, one of skill in the art would readily appreciate that means adapted to vary the flow rate in the channel structure could be any of various flow rate controllers (e.g. pumps or electroosmotic flow or electrokinetic flow as described in the Parce reference cited by the Examiner) as is well known in the art.

Other examples of conditions that can be varied with respect to the channel structure are described in the specification, for example, at page 5, lines 5-8 (describing physical conditions of the channel structure that can be varied), at page 5, lines 10-17 (describing chemical conditions in the channel structure that can be varied), and at page 5, lines 19-24 (describing chemical conditions of the channel structure that can be varied). One of skill in the art would readily appreciate the various means that could be adapted to vary such conditions in, or of, the channel structure.

For at least the foregoing reasons, Applicants respectfully submit that claims 1 and 4 are definite and request that these rejections be withdrawn.

In rejecting claim 11, the Action states that the term “predetermined objective” in claim 11 is a relative term which renders the claim indefinite. Applicants respectfully disagree. The term “predetermined objective” is not a relative term. It simply means the computer is programmed to attain a defined target for the predetermined property, through computer-control of the related condition, as outlined in the Summary of the Invention.

For at least the foregoing reasons, Applicants respectfully submit that claim 11 is definite and request that this rejection be withdrawn.

Applicants have canceled claims 19 and 23 without prejudice, thereby obviating the rejection thereof.

III. Section 101 Rejection Addressed

Applicants have canceled claims 19 and 23 without prejudice, thereby obviating this rejection.

IV. Section 102(b) Rejection Overcome

Claims 1-21 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,046,056 (Parce). Applicants respectfully traverse this rejection.

Claim 1 recites, in part, “a system having . . . an automated closed-loop control mechanism to autonomously control a condition in, or of, the channel structure, the control mechanism having:-

a sensor adapted to produce a sensor signal representative of a predetermined property of the at least one product which is dependent on the condition in, or of, the channel structure,

means adapted to vary the condition in, or of, the channel structure, and

a computer adapted to receive the sensor signal and to cause the means to vary the condition in, or of, the channel structure in dependence of the sensor signal.”

At page 4, the Action states that Parce “discloses a micro-fluidic system that is a closed-loop system (Fig. 6C).” (Emphasis added). While Parce may disclose a system that is a closed-loop system (*i.e.* allows fluid flow around a closed-loop), Parce does not disclose or suggest a system that has an automated closed-loop control mechanism to autonomously control a condition in, or of, the channel structure as recited in claim 1. As will readily be appreciated by one of skill in the art, the disclosure or suggestion of a closed flow loop in no way anticipates or suggests the recitation of a closed-loop control mechanism which autonomously controls a condition in, or of, a microfluidic channel structure through feedback of a sensor signal representative of the condition to a computer which then operates to vary the condition in dependence of the sensor signal.

For at least the foregoing reasons, Applicants respectfully submit that claim 1 is patentable over Parce and request that this rejection be withdrawn.

Claims 2-21 each depend from patentable independent claim 1. For at least this reason and without acquiescing in the Action's rejections of these claims, Applicants respectfully submit that these dependent claims are also patentable and request that these rejections be withdrawn. Applicants expressly reserve the right to argue the separate patentability of one or more of these dependent claims at a future date.

V. Section 103(a) Rejections Overcome

Claims 22 and 23 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Parce. Applicants respectfully traverse these rejections.

Claim 23 has been canceled without prejudice. Claim 22 depends from patentable independent claim 1. For at least this reason and without acquiescing in the Action's rejections of this claim, Applicants respectfully submit that this dependent claim is also patentable and request that this rejection be withdrawn. Applicants expressly reserve the right to argue the separate patentability of this dependent claim at a future date.

VI. Conclusion

All claim rejections being addressed in full, Applicant respectfully requests the withdrawal of the outstanding objections and rejections and the issuance of a Notice of Allowance. Should the Examiner have any questions regarding the foregoing, Applicant respectfully requests that the Examiner contact the undersigned, who can be reached at (919) 483-9024.

Respectfully submitted,

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